WHAT IS CLAIMED IS:

1. An ion mobility spectrometer, comprising:

a switchable sample loop device;

an ion mobility spectrometer (IMS) cell with a sample gas inlet and a sample gas outlet;

a circulation pump;

a circulation filter;

an analytical circulation pump;

an analytical circulation filter;

a gas chromatography (GC) column; and

a flow path defining an internal controlled gas circulation with a gas flow to be analyzed from the sample gas outlet of the IMS cell to the circulation pump, circulation filter, analytical circulation pump and analytical circulation filter and branching into two partial flows with a smaller partial flow sent via said switchable sample loop device for passing the flow on or providing a sampling and subsequently via said GC column to said sample gas and with a larger partial flow of the gas to be analyzed sent back to just upstream of said analytical circulation pump and analytical circulation filter, and a pressure sensor and a temperature sensor in functional connection with said internal controlled gas circulation.

2. An ion mobility spectrometer in accordance with claim 1, further comprising a gas splitter internally in the IMS cell for splitting gas flow between a drift gas flow and the flow of the gas to be analyzed, wherein said IMS cell has an additional gas inlet and an additional gas

outlet, with said circulation pump, said circulation filter, said pressure sensor and said temperature sensor being arranged in a gas circulation loop between said additional gas outlet and said additional gas inlet.

3. An ion mobility spectrometer in accordance with claim 1, further comprising a gas splitter, arranged outside the IMS cell, for splitting gas flow into a drift gas flow q1 sent into the cell via another IMS cell inlet and the flow of gas to be analyzed.

4. An ion mobility spectrometer in accordance with claim 1, further comprising a splitter in the flow of gas to be analyzed to form a partial diluting flow for diluting the sample and a remaining flow of gas to be analyzed.

5. A method of using an ion mobility spectrometer with a switchable sample loop device comprising an ion mobility spectrometer (IMS) cell with a sample gas inlet and a sample gas outlet, a circulation pump, a circulation filter, an analytical circulation pump, an analytical circulation filter, a gas chromatography (GC) column and a flow path defining an internal controlled gas, the method comprising:

directing a gas flow to be analyzed to leave the IMS cell via the analytical circulation pump and analytical filter;

splitting the gas flow to be analyzed downstream of the analytical circulation pump and analytical circulation filter into two partial flows with the larger partial flow returned in a closed circuit to the area upstream of the analytical circulation pump and with the other partial flow sent

via the switchable sample loop device to the GC column and then to the sample inlet of the IMS cell.

6. An ion mobility spectrometer system, comprising:

a switchable sample loop device;

an ion mobility spectrometer (IMS) cell with a sample gas inlet and a sample gas outlet;

a circulation pump;

a circulation filter;

an analytical circulation pump;

an analytical circulation filter;

a gas chromatography (GC) column;

a sampling gas flow of a gas to be sampled;

a solenoid valve through which said sampling gas flow passes; and

a flow path defining an internal controlled gas circulation with a gas flow to be analyzed from the sample gas outlet of the IMS cell to the circulation pump, circulation filter, analytical circulation pump and analytical circulation filter and branching into two partial flows with a smaller partial flow sent via said switchable sample loop device for passing the flow on or providing a sampling and subsequently via said GC column to said sample gas and with a larger partial flow of the gas to be analyzed sent back to just upstream of said analytical circulation pump and analytical circulation filter, and a pressure sensor and a temperature sensor in functional connection with said internal controlled gas circulation, said system at any particular time operating in one of:

i) a stand-by mode wherein said solenoid valve allows said sampling gas flow to pass through said solenoid valve without diversion, and gas involved in said internal controlled gas circulation is purified by said circulation filter and said analytical circulation filter;

ii) a sample acquisition mode in which said solenoid valve captures a sample of the sample gas to be sampled from the sample gas flow and transfers said sample to said internal controlled gas circulation introducing said sample to said internal controlled gas circulation; and

iii) an analysis mode wherein the sample introduced in the sample acquisition mode is analyzed.

7. An ion mobility spectrometer system in accordance with claim 6, further comprising a gas splitter internally in the IMS cell for splitting gas flow between a drift gas flow and the flow of the gas to be analyzed, wherein said IMS cell has an additional gas inlet and an additional gas outlet with said circulation pump, said circulation filter, said pressure sensor and said temperature sensor being arranged in a gas circulation loop between said additional gas outlet and said additional gas inlet.

8. An ion mobility spectrometer system in accordance with claim 6, further comprising a gas splitter, arranged outside the IMS cell, for splitting gas flow into a drift gas flow q1 sent into the cell via another IMS cell inlet and the flow of gas to be analyzed.

9. An ion mobility spectrometer system in accordance with claim 6, further comprising a splitter in the flow of gas to be analyzed to form a partial diluting flow for diluting the sample and a remaining flow of gas to be analyzed.